REMARKS/ARGUMENTS

35 U.S.C. §112 second paragraph .

The Examiner has raised a number of objections to the claims as indefinite.

The Examiner has objected to claim 5 for improper dependency on claim 4. Applicant respectfully disagrees with the Examiner's reasoning. The Examiner's statement that "the molecular weight of SEQ ID NO: 14 is well in excess of 15 kD" is incorrect. The actual sequence-predicted molecular weight of the protein is 15,223 (see Dawe and Duncan, 2002, J Virol 76:2131-2140). Furthermore, if the molecular weight of the N-terminal myristate moiety (210 g/mol) is included, then correspondingly, the molecular weight of the N-terminal methionine residue (131 g/mol) must be deleted. That is because the N-terminal methionine residue has to be removed prior to the addition of the myristate moiety to the amide group of the penultimate N-terminal glycine residue. In the result, the myristoylated protein molecular weight is 15,301. In either case (*i.e.* whether myristoylated or non-myristoylated) the molecular weight of the peptide of SEQ ID NO: 14 is not "well in excess of 15 kD". The Examiner is requested to reconsider this objection.

The Examiner's objections to claim 4 have been avoided by deletion of the term "about" at one location, as well as the term "relatively small" at two locations. The term "relatively non-immunogenic" has been replaced by "substantially non-immunogenic in a mammal" (see page 24, lines 12 to 15).

The Examiner's objections to claims 5 and 6 have been avoided by deleting the term "BRV".

Claim 57 is rejected as indefinite with respect to what may be encompassed by the term "membrane fusion" protein. The claim has been amended to clarify that the claimed protein

induces membrane fusion (see page 19). We do not believe the example given by the Examiner is relevant to the objection made. However, even if the Examiner's thesis is true, nonetheless the membranes referred to in the Examiner's example are not proteins which induce membrane fusion.

35 U.S.C. §102 (b)

The Examiner has objected to claim 4 as anticipated by one or other of Subramanian and Ernst. The Examiner notes that each of these references discloses a peptide obtained from a reovirus and which has a molecular weight similar to that taught by the applicant.

The Subramanian reference was published sometime in 1997. Applicant's effective filing date is November 7, 1997, the filing date of USSN 08/965,708, of which this application is a continuation. Since Subramanian was not published more than one year prior to the date of the application for patent, it is not citable on this ground.

Furthermore, claim 4 is restricted to proteins that have the following characteristics in addition to the two characteristics mentioned by the Examiner as described by Subramanian and Ernst, namely:

one transmembrane domain,
one intracelluar domain,
an extracellular domain containing an alpha helix motif,
substantial non-immunogenicity in a mammal,
lack of a signal peptide, and
lack of N-linked glycosylation signals.

There is no suggestion whatsoever in either Subramanian or Ernst as to the presence or absence, respectively, of any of these recited features.

The following extract appears in the Manual of Patent Examining Procedure.

> The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)....
>
> "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original).

Accordingly, in order for a claim to be anticipated, the Examiner is not entitled to speculate as to what characteristics may or may not be present (inherent) in the cited art. There must be some evidence from the art, or which would be known to one of skill in the art, that the products described in the cited references do indeed contain each and every one of these additional properties. No such evidence exists in this case. The Examiner is requested to withdraw the objection, or, alternatively, to indicate where in the cited references these additional claimed features are taught.

35 U.S.C. §103

Claim 57 is rejected as obvious over the Subramanian reference, in view of Schullery or Lentz or Fonteijn. The Examiner notes that Subramanian teaches a peptide having a molecular weight similar to that claimed by the applicant, and which is encoded by a polynucleotide from Reoviridae. The Examiner then argues that because each of the secondary references discloses that liposomes can undergo spontaneous fusion, the combination of references would obtain applicant's claimed protein.

The following extract appears in the Manual of Patent Examining Procedure.

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

In view of this summary of the law, applicant respectfully disagrees that amended claim 57 is obvious. Claim 57 is restricted to proteins that induce membrane fusion. The claim amendment is supported throughout the specification, particularly at pages 19 and 24, and in the claims as originally filed. No new matter is introduced by the amendment.

The Schullery, Lentz and Fonteijn references all deal with "spontaneous" membrane fusion between artificial phospholipid bilayers that are manipulated *in vitro*. It is well known in the field that such artificial bilayers can be made to fuse by manipulating lipid composition,

temperature, vesicle size, phase transition, etc. It is also well known that a limited number of proteins have the ability to induce fusion of bilayers under conditions where they will not fuse spontaneously. The fact that artificial lipid bilayers can be made spontaneously to fuse by means other than a fusion protein is irrelevant to the notion that a restricted number of proteins have the ability to induce membrane fusion. No person skilled in the art would consider these facts about "spontaneous" membrane fusion as contradictory to their understanding of what is meant by a membrane fusion protein which actually induces membrane fusion.

Based on this explanation, it will be apparent that one of skill in the art would never consider that the Subramanian protein had induced membrane fusion merely because membrane fusion had resulted upon adding such a protein to lipid bilayers under conditions where spontaneous membrane fusion was expected.

In the result, none of the cited references either alone or in combination suggest a protein which has the ability successfully to induce membrane fusion. The Examiner's argument that the term "membrane fusion protein" could encompass a protein which permits membrane fusion to occur when it is present has been resolved by restricting applicant's claim to proteins which must actively cause membrane fusion rather than merely permit it to occur or be present when it occurs spontaneously. The Examiner is requested to withdraw the objection, or alternatively, to indicate where in the cited references is taught a protein which actually induces membrane fusion.

It is believed that these amendments and remarks resolve all of the Examiner's stated concerns, and that the claims under examination are in form for allowance.

The petition for extension of time pursuant to 37 CFR1.136(a) and the fee accompany this letter. The USPTO is authorized to withdraw from our deposit account number 19-2550 any excess fees if required.

PAGE 19/20 * RCVD AT 5/12/2005 4:39:55 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/4 * DNIS:8729306 * CSID:6132328440 * DURATION (mm-ss):05-18

In view of the foregoing, early favorable consideration of this application is earnestly solicited.

Respectfully submitted,

ROY DUNCAN

Date: May 12, 2005

By _____
Joy D. Morrow
Reg. No. 30,911
Tel.: (613) 232-2486 ext. 264
Fax: (613) 232-8440

Correspondence address:
Smart & Biggar
P.O. Box 2999, Station D
Ottawa, Ontario,
Canada K1P 5Y6

JDM:lsj

PAGE 20/20 * RCVD AT 5/12/2005 4:39:55 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/4 * DNIS:8729306 * CSID:6132328440 * DURATION (mm-ss):05-18